

## Patent claims

1. A voltage regulator comprising:
  - an output terminal (AK) for the provision of an
  - 5 output voltage and connection of a load,
  - an output capacitor (20) connected to the output terminal and having an equivalent series resistance (ESR),
  - a converter unit (10) having supply voltage
  - 10 terminals for the application of a supply voltage ( $V_{cc}$ ), an output coupled to the output terminal (AK), a feedback signal input for feeding in a feedback signal ( $V_{fb}$ ) dependent on the output voltage, a reference signal input for feeding in a reference signal ( $V_{ref}$ ),
  - 15 wherein
  - the converter unit (10) provides an output current ( $I_{out}$ ), the mean value of which is proportional to the difference between the reference signal ( $V_{ref}$ ) and the feedback signal ( $V_{fb}$ ), the proportionality factor
  - 20 between this difference and the output current ( $I_{out}$ ) being adjustable by means of a control signal at a control input of the converter.
2. The voltage regulator as claimed in claim 1, in
- 25 which the control signal (CTRL) is selected in such a way that the proportionality factor is proportional to the reciprocal of the equivalent series resistance (ESR) of the output capacitor.
3. The voltage regulator as claimed in claim 1 further
- 30 comprising a comparator unit (TA3) which provides a differential signal ( $I_{ea}$ ) from the reference signal ( $V_{ref}$ ) and the feedback signal ( $V_{fb}$ ).
4. The voltage regulator as claimed in claim 3, in
- 35 which the converter unit has the following further features:

- a switching converter (T1, T2, L) having an inductance (L) and a switching unit (T1, T2) for the clocked connection of the inductance to the supply voltage (Vcc) according to a pulse-width-modulated signal (PS),
- a pulse width modulator (PWM), which provides the pulse-width-modulated signal (PS) according to a regulation signal (Isum) dependent on the differential signal (Iea).

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5. The voltage regulator as claimed in claim 4, in which the regulation signal (Isum) is dependent on the differential signal (Iea) and a signal (I12) dependent on the output current.

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6. The voltage regulator as claimed in claim 4, in which the regulation signal (Isum) is dependent on a difference between the differential signal (Iea) and the signal (I12) dependent on the output current.

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7. The voltage regulator as claimed in one of claims 2 to 4, in which the pulse width modulator has a comparator unit with switching hysteresis, to which the regulation signal (Isum) is fed and which provides the pulse-width-modulated signal (PS) depending on a comparison of the regulation signal (Isum) with a first and second threshold value (TH1, TH2).

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8. The voltage regulator as claimed in one of the preceding claims, in which the comparator unit (TA3) has a control input for feeding in a control signal (CTRL), which sets the gain factor.

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